



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/058,708	01/28/2002	Kay Hellig	1458.TT4978	7368

34456 7590 07/02/2003

TOLER & LARSON & ABEL L.L.P.
PO BOX 29567
AUSTIN, TX 78755-9567

EXAMINER

LUHRS, MICHAEL K

ART UNIT PAPER NUMBER

2824

DATE MAILED: 07/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

10/058,708

Applicant(s)

HELLIG ET AL.

Examiner

Michael K. Luhrs

Art Unit

2824

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 18 is/are pending in the application.
- 4a) Of the above claim(s) 14-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 18 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10/02 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of claims group I method claims, 1-13 and 18 in Paper No. 7 is acknowledged. The traversal is on the ground(s) that lack grounds for independent and distinct and further, that different classification are not in and of themselves adequate grounds for restriction. This is not found persuasive because the apparatus is able to support a separate patent as distinct structure an apparatus without regard to how it is made and further that the restriction reasoning is adequate for different classification having provided also the reasoning for different process (MPEP § 806.05(f)).

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-13 and 18 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Etching of the dielectric spacer layer, prior to forming a layer subsequent to the dielectric layer is not enabled by the disclosure. In reviewing, Fig. 4, layer 22, (the dielectric layer) is not etched prior to forming the subsequent layer namely layer 24. In fact, layer 22 is etched after the formation of the subsequent layer 24/25 as shown in Fig. 6 as it becomes layer 27. In Fig. 6 layer 27 has been etched yet the subsequent layer 25, is already formed.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Art Unit: 2824

5. Claims 7 - 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding claim 7,...antecedent for the 'dielectric layer' points to applicant's layer '27' in Fig. 6, and since claim 1 has the etching of the dielectric spacer layer prior to forming another layer, *subsequent* to the dielectric layer, then that means the dielectric layer to which claim 7 is referring, is layer 27 in Fig. 6. Therefore, since layer 27 does not show any variable thickness vertically or horizontally, claim 7 is assertively, erroneously, confusing the L-shaped spacer with the variable profile layer. Regarding claim 8, an L-shaped spacer, as shown in applicant's Fig. 6 as layer "27", does not show any bulging profile, rather the bulging profile appears in layer "25" - that is not an L-shaped spacer at all. It is suggested, that when referring to the L-shaped spacer "27", the applicant not include any description regarding the appearance of layer "25". It is thus, necessary that layer 25 be described in the method steps to form its variable profile, since corrective action to the description to the dielectric layer 27, will necessitate explanation of the formation of layer 25 profile. See below:

6. Claims 1-13 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: The description of formation of "a layer" in line 5 of claim 1. There is no definitive steps outlining the formation of "a layer", yet the layer formed subsequent to the dielectric layer has the variable profile as described in claim 8 yet there is no connection between the "layer" in claim 1 to the profile description in claim 8, is assertively necessitating a correlation.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 2824

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. Claims 1-6 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Beckx et. al. USPN 6,096,657. Regarding claims 1 and 18, Beckx et. al. teach substrate 1, (line 7, column 4), liner 4, (line 20, column 4), dielectric 5 (line 21 column 4), and a layer subsequent, as layer 6 (line 40, column 4). High anisotropical etch is described in line 66-67 column 5. Regarding claim 2, liner oxide 4, is formed over a gate structure 2 as shown in any of the various Figures. Regarding claim 3, oxide layer 4, is 50 nm (line 21 column 4) is not between 20 Angstroms and 200 Angstroms, yet the invention is not limited to thickness as discussed in line 13, column 4. Regarding claims 4 and 5, the dielectric is nitride, (line 20, column 4) and is 20 nm (line 22, column 4) in thickness that falls within 150 Angstroms and 500 Angstroms. Regarding claim 6, Beckx et. al. teach a nitride layer for the dielectric spacer layer—a nitride layer can be a *silicon oxynitride* layer since a nitride layer would include a layer comprised of silicon oxynitride which includes nitride.

9. Claims 7-10 have not been treated on the merits since identification of the L-shaped spacers requires resolution of claim 1 *35 USC § 112* issue. Regarding claims 9 and 10 (that are dependent on claim 7 that has a 35 U.S.C. 112, first and second paragraph issue) the following is offered, carbon-fluorine based chemistry may be used (line 3, column 6). Carbon-fluorine based chemistry would include CF₃F, since CH₃F includes carbon and fluorine.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Art Unit: 2824

11. Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beckx et. al. as applied to claim 1 above, and further in view of Gupta et. al. (USPN 6,391,732). Beckx et. al. is silent regarding O₂. While Gupta et. al. teach etch chemistry CH₃F with O₂ in combination (lines 37-44, column 4) and Argon inert for the purpose of etching that inhibits lateral etching (line 50-51 column 4). Since Gupta et. al. teach *any* combination, the particular ratios of the claim, temperatures and pressures are included within Gupta et. al.. Since Gupta et. al. and Beckx et. al. are all from the same field of endeavor, the purpose disclosed by Gupta et. al. would have been recognized in the pertinent art of Beckx et. al. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to etch using CHF₃ and O₂ and Ar for the purpose of inhibiting lateral undercut of the layer with the motivation of forming a new L-shape (from layer 74 to layer 64, lines 52-53 column 4) as Gupta et. al. teaches is alternative method to provide a spacer having the benefit of being filled later on without gapping (see lines 54-55 column 1) should thus include such etch chemistry in the event one is targetting the particular profile that Gupta et. al. intends to provide.

Response to Arguments

- 12.** Applicant's arguments filed 4-21-03 have been fully considered but they are not persuasive.
- a. Applicant points to figures 4, 6, 13-14. Examiner acknowledges bulge in figure 14. The 35 USC § 112 issues however, are related to the method sequence as it relates to claim 1 wording for the examiner's cited figures.
 - b. Applicant points to Beckx layer 6, Fig. 1, however, without having corrected the 35 USC § 112 issues the argument cannot be considered.

Conclusion

- 13. THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


Art Unit: 2824

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael K. Luhrs whose telephone number is 703-305-2864. The examiner can normally be reached on M-F; 8:00 a.m. - 5:00 p.m. (other Fridays off)..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard T. Elms can be reached on 703-308-2816. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.


Michael K. Luhrs
June 30, 2003



RICHARD ELMS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800